Mauli Group of Institution's,
Late Purushottam Hari (Ganesh) Patil Shikshan Sanstha's
College of Engineering and Technology, Shegaon
AICTE Approved, Affiliated to Sant Gadge Baba Amravati University, Amravati, ISO 9001:2015 Certified

Department of Electronics and Telecommunication Engineering

A.Y. 2022-2023

B.E. 3rd Sem

Course: Engineering Mathematics – III   **Course Code: (3ETC01)**

At the end of Engineering Mathematics – III course, the students will be able to:

CO No.	Course Outcome	Level of Learning (as per Bloom's Taxonomy)
1	Demonstrate the knowledge of differential equations to solve engineering problems of analog systems.	L3
2	Apply Laplace transform to solve differential equations.	L3
3	Apply knowledge of vector calculus.	L3
4	Comprehend knowledge of complex analysis in terms of complex variables, harmonic functions and conformal mapping.	L4
5	Apply numerical methods to obtain approximate solutions to mathematical problems.	L3
6	Calculate partial difference equations as applied to discrete systems.	L3

Course: Electronic Devices and Circuits   **Course Code: (3ETC02)**

At the end of Electronic Devices and Circuits course, the students will be able to:

CO No.	Course Outcome	Level of Learning (as per Bloom's Taxonomy)
1	Analyze the operation of diodes for various applications.	L4
2	Illustrate wave shaping circuits for various signals.	L3
3	Analyze the various configurations of BJT.	L4
4	Apply feedback concepts in various applications.	L3
5	Construct the different types of multistage amplifiers.	L4
6	Analyze the operation of JFET, MOSFET and UJT.	L4

Course: Digital System Design   **Course Code: (3ETC03)**

At the end of Digital System Design course, the students will be able to:

CO No.	Course Outcome	Level of Learning (as per Bloom's Taxonomy)
1	Calculate binary, decimal, hexadecimal, BCD, Excess 3 and gray code and its conversions.	L3
2	Apply reduction techniques like k-map and tabular method to the Boolean equations	L3
3	Analyze combinational Logic Circuits like MUX, DMUX, Encoder, decoder, Adder, Subs tractor, magnitude comparator.	L4
4	Analyze Sequential Logic Circuits like Flip flops, counter, shift register.	L4
5	Evaluate the digital logic families and their characteristics.	L5
6	Analyze the clocked sequential circuits.	L4

Course: Electromagnetic Waves   **Course Code: (3ETC04)**

At the end of Electromagnetic Waves course, the students will be able to:

CO No.	Course Outcome	Level of Learning (as per Bloom's Taxonomy)
1	Calculate the coordinate systems and vector integrals.	L3
2	Recommend Electric Field Intensity for different charge distributions.	L5
3	Judge the Magnetic Field Intensity due to current carrying conductors.	L5
4	Categorize Maxwell's equations & Boundary conditions.	L4
5	Illustrate the concept of propagation of electromagnetic waves in free space.	L3
6	Evaluate the radiation characteristics of electromagnetic wave theoretical & practical antennas	L5

Course: Object Oriented Programming   **Course Code: (3ETC05)**
At the end of Object Oriented Programming course, the students will be able to:

CO No.	Course Outcome	Level of Learning (as per Bloom's Taxonomy)
1	Illustrate the basic concepts of object-oriented programming such as data types, functions, classes, objects, constructors, inheritance, overloading etc.	L3
2	Analyze the programs in C++.	L4
3	Describe how the class mechanism supports encapsulation and information hiding.	L2
4	Explain the concept of operator overloading.	L2
5	Illustrate the inheritance in C++.	L3
6	Apply Java programming concepts.	L3

Lab: Electronic Devices and Circuits   **Lab Code: (3ETC06)**
At the end of Electronic Devices and Circuits Lab, the students will be able to:

LO No.	Lab Outcome	Level of Learning (as per Bloom's Taxonomy)
1	Evaluate the operation of various semiconductor devices.	L5
2	Demonstrate the operation of basic circuits using electronic devices.	L3
3	Analyze the performance of electronic circuits.	L4

Lab: Digital System Design   **Lab Code: (3ETC07)**
At the end of Digital System Design Lab, the students will be able to:

LO No.	Lab Outcome	Level of Learning (as per Bloom's Taxonomy)
1	Implement combinational logic circuits.	L3
2	Analyze the code conversion technique from logic Circuit.	L4
3	Implement sequential logic circuits.	L3

Lab: Object Oriented Programming   **Lab Code: (3ETC08)**
At the end of Object Oriented Programming Lab, the students will be able to:

LO No.	Lab Outcome	Level of Learning (as per Bloom's Taxonomy)
1	Implementation of C++ programming concepts.	L3
2	Evaluate programs in an object-oriented programming language.	L5
3	Implementation of java programming concepts.	L3

Lab: Electronic Workshop   **Lab Code: (3ETC09)**
At the end of Electronic Workshop Lab, the students will be able to:

LO No.	Lab Outcome	Level of Learning (as per Bloom's Taxonomy)
1	Apply the basic designing and simulation tools.	L3
2	Analyze the basic components of electronics.	L4
3	Apply basic knowledge of components to hardware implementation.	L3

Prof. S. S. Mhaske
HOD-ENTC

B.E. 4th Sem

Course: Analog and Digital Communication   **Course Code: (4ETC01)**

At the end of Analog and Digital Communication course, the students will be able to:

CO No.	Course Outcome	Level of Learning (as per Bloom's Taxonomy)
1	Illustrate the various components of analog and digital communication systems	L3
2	Categorize the performance of analog communication systems.	L4
3	Implement the concepts of Probability theory in communication systems	L3
4	Distinguish the performance of various pulse modulation scheme	L4
5	Analyze the basic building block of digital communication system.	L4
6	Compare the concepts of information theory and analyze information transmission over communication channel.	L4

Course: Analog Circuits   **Course Code: (4ETC02)**

At the end of Analog Circuits course, the students will be able to:

CO No.	Course Outcome	Level of Learning (as per Bloom's Taxonomy)
1	Illustrate the basics and internal structure of Op-amp	L3
2	Apply the concepts and design linear applications of Op-amp	L3
3	Analyze and design nonlinear applications of Op-amp.	L4
4	Implement voltage regulator circuit using IC 723, LM 317.	L3
5	Analyze the waveform using IC 555 and IC 565.	L4
6	Illustrate the knowledge of PLL and its applications.	L3

Course: Network Theory   **Course Code: (4ETC03)**

At the end of Network Theory course, the students will be able to:

CO No.	Course Outcome	Level of Learning (as per Bloom's Taxonomy)
1	Apply suitable source transformation, mesh and node analysis to find the current and voltages in the circuit.	L3
2	Apply suitable Network Theorem to analyze electrical circuits.	L3
3	Apply the graph theory technique to determine their currents and voltages of a network.	L3
4	Implement the concept of Laplace Transform for electrical circuit analysis.	L3
5	Apply Two-Port network theory for electrical network analysis.	L4
6	Analyze different Network Functions.	L4

Course: Signals and Systems   **Course Code: (4ETC04)**

At the end of Signals and Systems course, students will be able to:

CO No.	Course Outcome	Level of Learning (as per Bloom's Taxonomy)
1	Apply the basic mathematical operations on continuous time signals.	L3
2	Calculate the spectral characteristics of continuous-time periodic signals using Fourier series.	L3
3	Analyze the spectral characteristics of continuous-time aperiodic signals using FT.	L4
4	Apply the Laplace transform for analysis of continuous-time signal.	L3
5	Apply basic mathematical operations on discrete time signals	L3
6	Analyze the spectral characteristics of discrete-time signals using FT& DTFT.	L4

Course: Values & Ethics   **Course Code: (4ETC05)**

At the end of Values & Ethics course, students will be able to:

CO No.	Course Outcome	Level of Learning (as per Bloom's Taxonomy)
1	Practice the significance of value inputs in a classroom and start applying them in their life and profession	L3
2	Distinguish between values and skills, happiness and accumulation of physical facilities, the Self and the Body, Intention and Competence of an individual, etc.	L4
3	Apply the role of a human being in ensuring harmony in society and nature.	L3
4	Analyze social responsibility of an engineer	L4
5	Distinguish between professional ethics and professional competence.	L4
6	Illustrate Strategies for Transition towards Value-based Life and Profession.	L3

Lab: Analog and Digital Communication   **Lab Code: (4ETC06)**

At the end of Analog and Digital Communication Lab, the students will be able to:

LO No.	Lab Outcome	Level of Learning (as per Bloom's Taxonomy)
1	Analyze performance characteristics of AM/FM receiver	L4
2	Implement line codes used for representation of digital waveforms	L3
3	Assess various MATLAB functions for digital Communication Systems.	L5

Lab: Analog Circuits   **Lab Code: (4ETC07)**

At the end of Analog Circuits Lab, the students will be able to:

LO No.	Lab Outcome	Level of Learning (as per Bloom's Taxonomy)
1	Demonstrate linear and non-linear applications of Op-Amp.	L3
2	Analyze various wave shaping circuits.	L4
3	Implement PLL in certain applications.	L3

Lab: Network Theory   **Lab Code: (4ETC08)**
At the end of Network Theory Lab, the students will be able to:

LO No.	Lab Outcome	Level of Learning (as per Bloom's Taxonomy)
1	Evaluate knowledge of Mesh and Node analysis for a given network.	L5
2	Apply various network theorems to solve networks.	L3
3	Analyze Two Port network and Network Functions to analyze a given network.	L4

Lab: Signals & Systems   **Lab Code: (4ETC09)**
At the end of Signals & Systems Lab, the students will be able to:

LO No.	Lab Outcome	Level of Learning (as per Bloom's Taxonomy)
1	Implement system equations using simulation tools.	L3
2	Analyze the various basic continuous signals.	L4
3	Demonstrate the concepts of sampling.	L3

Prof. S. S. Mhaske
HOD-ENTC